Stormwater Management and Other Neighborhood Improvements

PROGRAM DESCRIPTION

The Stormwater Management and Other Neighborhood Improvements section consists of: Stormwater Control, Streetlights, and the County Neighborhood Improvement Program.

LINK TO THE COMPREHENSIVE PLAN

Fairfax County's Comprehensive Plan has established a number of objectives and policies in order to:

- ✓ Provide a system of drainage facilities that prevents or minimizes structure flooding, stream degradation, and traffic disruption in an efficient, cost-effective, and environmentally sound manner.
- ✓ Identify, protect, and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County, and implement programs to improve older residential areas of the County to enhance the quality of life in these areas, including Mount Vernon Hills and Holmes Run Valley.
- ✓ Protect and restore the ecological integrity of streams in Fairfax County.
- ✓ Apply better site design and low impact development (LID) techniques, and pursue commitments to reduce stormwater runoff volumes and peak flows, to increase groundwater recharge, and to increase preservation of undisturbed areas.
- ✓ Provide for a drainage improvement and stormwater management program to maximize property protection and environmental benefits in the watershed.

Source: 2003 Edition of the Comprehensive Plan, as amended.

CURRENT PROGRAM INITIATIVES

Stormwater Management Program

Fairfax County's Stormwater Control program is currently undergoing a transformation where all activities are addressed on a comprehensive watershed basis. Beginning in FY 2006, the Board of Supervisors dedicated the approximate value of one penny from the County's Real Estate tax to support the growing needs and regulatory requirements in the stormwater program. This program consists of: Watershed Planning, Watershed Projects Implementation, Kingstowne Environmental Monitoring Program, Dam Safety, Virginia Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (MS4), Emergency Watershed Improvements, and Infrastructure Maintenance.

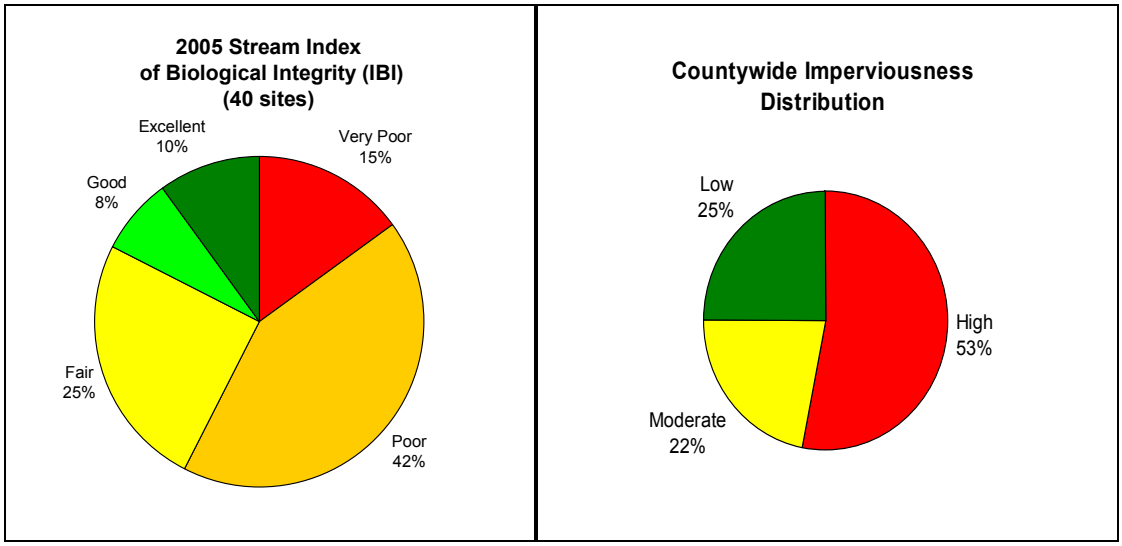
The long-range goal or mission for the stormwater program is dictated by the County's need to preserve and restore the natural environment and water resources while being in full compliance with all applicable federal and state laws and mandates. Many of the requirements are derived from the State's Chesapeake Bay Initiatives, Clean Water Act requirements, and County ordinance and policies such as the Water

Supply Protection Overlay District. In order to comprehensively address program requirements and strategies for restoring water quality on a holistic basis, updated watershed management plans are under development.

Watershed Planning and Implementation

The completion of watershed management plans for all 30 County watersheds will occur during this 5-year CIP cycle. Previously prepared watershed master plans developed during 1970s do not reflect changes in stream conditions resulting from land use practices and environmental initiatives that have arisen over the last 30 years. In addition, Watershed plans provide targeted strategies for addressing stream health given various current/future land use practices and relative stream conditions.

As depicted on graph A below, less than 20 percent of the County's streams are in good to excellent biological health condition based on stream monitoring conducted between 1999 and 2005. The remaining 80 percent of the streams are in fair to very poor condition. The condition of a stream is determined using an Index of Biological Integrity (IBI) which evaluates stream ecological health based on the community structure of bottom-dwelling aquatic invertebrates. A baseline study completed in 2001 determined that increased levels of imperviousness (paved surfaces that are unable to absorb water) result in diminished IBI values and poorer water quality Over the last several decades, the County's percent of imperviousness has increased drastically due to additional growth which is contributing to the current degradation of the streams. Moderate stream degradation becomes apparent when imperviousness reaches 10-20 percent within a watershed. High levels of degradation occur as imperviousness exceeds 20 percent. As depicted on the graph B below, 53 percent of the County land area has imperviousness at or above 20 percent (high). In addition, 22 percent of the County land area is between 10-20 percent imperviousness (moderate) and just 25 percent is between 0 percent and 10 percent (low) imperviousness.



A **B**

In 2005, as part of the ongoing stream monitoring program, bacteriological analysis determined that 90 percent (35 out of 39) of the monitoring site locations had at least one water sample that exceeded the state's instantaneous standard for *E. coli.* Six rounds of bacteria monitoring were completed in 2005; two per season starting in the spring. Ten percent of the sites never exceeded the state's standard, one third of the sites exceeded once, one third of the sites exceeded twice, 18 percent exceeded three times, and 5 percent of the sites exceeded four times. There were no sites in Fairfax County that exceeded the state standard more than four out of six times. This program was initiated by the Health Department in the late 1960s to monitor for excessive amounts of fecal-related inputs into the county's waterways. It has since been transferred to Stormwater Management. While the ambient concentrations of these bacteria in surface waters can exhibit significant variability due to many different factors such as wildlife, septic leaks, livestock, pets, etc, extremely high concentrations can be indicative of sanitary sewer contamination. This detection triggers a cooperative multi-agency response effort to determine the appropriate and corrective action(s). Because of this collaborative monitoring and response effort, sanitary sewer leaks are usually detected and remedied before becoming serious, chronic or episodic contaminations.

The Federal Clean Water Act and Virginia laws require Fairfax County to meet water quality standards for surface streams and groundwater. The County discharges stormwater from its storm drainage network into the waters of the State as a privilege that can be revoked if standards are not met.

In addition, Fairfax County's watersheds drain into the Potomac River and eventually into the Chesapeake Bay, which does not currently meet federal water quality standards. Virginia has signed agreements with other states and federal agencies to work toward restoring the Chesapeake Bay. The latest agreement, *Chesapeake Bay 2000,* includes the goal of developing watershed plans for two thirds of the Bay's watersheds by 2010. In order to meet this goal, Virginia has encouraged Fairfax County and other jurisdictions to develop plans for cleaning up their watersheds. Virginia and other signature states to the Chesapeake Bay agreement have also prepared "Tributary Strategies" to set specific targets for reduction and capping of nutrients and sediment pollutants entering the Bay through its various tributaries, such as the Potomac River. The Potomac River Basin Tributary Strategy was completed in 2005 and established state-wide reduction goals. The state is working with jurisdictions to collaborate on point source (wastewater treatment plants) and non-point source implementation to increase water pollution control measures to effectively improve conditions and help remove the Bay from the federal impaired ("dirty") waters list by 2010.

In order to meet the goals of these initiatives, the development of watershed management plans for all County watersheds is being pursued. They are scheduled for completion in FY 2010. As watershed management plans are developed for each of the 30 watersheds, projects are identified that will restore and protect the County's streams. These projects improve water quality and provide increased community stewardship opportunities in support of state/federal requirements and the County's commitment to the Chesapeake Bay 2000 Agreement and the MS4 permit. The types of improvements include public education campaigns, street/parking lot sweeping, acquisition of conservation easements, buffer restoration, wetlands restoration, conversion of stormwater management ponds to Best Management Practice (BMP) facilities, stream restoration, installation of Low Impact Development (LID) features, and traditional drainage projects to alleviate conveyance deficiencies. At the same time, the County provides comprehensive inspection, design, and contract administration programs to rehabilitate, upgrade, and replace dilapidated County drainage infrastructure. The storm drainage conveyance system alone consists of a network of over 1,800 miles of pipes and 45,000 drainage structures. The storm drainage rehabilitation program provides a managed approach for capital reinvestment of the existing storm drainage network in Fairfax County.

Other Stormwater Activities

Other activities supporting the overall Stormwater management effort in the County include; Dam Safety efforts in order to meet State requirements; requirements associated with the Virginia Pollutant Discharge Elimination System - Municipal Separate Storm Sewer System (MS4) permit which provides the overarching basis for the County's comprehensive stormwater management program, consisting of watershed management plans, project implementation, monitoring, dam safety, and infrastructure maintenance; and emergency watershed projects to correct small scale emergency drainage problems that arise throughout the fiscal year.

While every effort has been made to accurately reflect the 5-year 2008-2012 capital improvement plan for the stormwater program, there are currently multiple issues that are in various stages of the regulatory and permitting processes that could have significant funding impacts to the stormwater program. Increased regulatory requirements associated with the renewal of the 5-year MS4 permit and increased State mandated requirements in the Dam safety program will most likely impact the current funding plan in the very near future. In addition to the anticipated escalation in regulatory requirements, recent countywide flood mitigation efforts and the severe flooding that occurred in the Huntington and Belle Haven communities in late June 2006 will require a significant amount of investment when the investigation studies, and project scoping phases, have been completed. Beyond these near-term impacts, there are ensuing discussions with the Fairfax County Park Authority and Fairfax County Schools pertaining to county-wide MS4 regulatory requirements that could also result in long term funding impacts to the stormwater program.

The maintenance needs at County facilities that use innovative stormwater management systems present another long-term funding impact to the stormwater program. Past stormwater maintenance at county-owned and operated facilities has traditionally consisted of maintenance of catch basins, storm pipes, and surface ponds. However, to meet current stormwater quality requirements, more extensive and complex stormwater management systems are being developed with "Best Management Practices". These

innovative systems will require more frequent and more complex operation and maintenance efforts to meet and comply with the stormwater permit from the state. Without the proper on-going operation and maintenance, the systems will likely fail. System failure will require more extensive costs for the systems to function as designed. As these innovative facilities and stormwater systems come on-line, funding will be required to meet the recurring maintenance requirements.

In addition, in recent years, the number of County renovation/ expansion, and redevelopment projects has increased. Many of these approved redevelopment projects are located on relatively small sites in more densely developed areas of the County. The need for renovation/expansion and redevelopment projects at older facilities on small sites has created new challenges for meeting the County's high expectations for environmental stewardship in the areas of stormwater management and water quality. The appropriate treatment of stormwater, including new adequate outfall requirements, requires new and innovative approaches to stormwater treatment at several redevelopment projects on tight sites. Despite the implementation of innovative stormwater detention and water quality elements such as bioretention ponds, sand filters, and rain gardens, the necessity of utilizing more structured underground stormwater detention and water quality systems has become apparent. Several redevelopment projects entering the construction phase in FY 2008 and FY 2009 will require the use of underground detention and water quality systems to assure adherence to County expectations for sound environmental treatment of runoff. The use of these underground detention features at redevelopment projects will necessitate changes to the current County program for maintenance of stormwater detention and water quality elements, and will impact the recurring costs of maintenance of County-owned stormwater management facilities. Prior to the first of these underground systems coming on line in FY 2010, a funding protocol will need to be instituted to assure the budgeting of appropriate recurring funds for maintenance of underground detention systems.

Photo of Lake Royal which is part of the County's extensive stormwater system that includes 1,800 miles of storm drainage conveyance systems, 45,000 stormwater drainage structures, and 1,104 stormwater management ponds.

Other Neighborhood Improvements

Other neighborhood improvement projects include streetlights and the implementation of sidewalks, curbs, gutters and storm sewers in older neighborhoods. The County Streetlight Program is designed to respond to the desires of citizens for additional community lighting in the interest of promoting the Crime Deterrence and Hazardous Intersection programs. New streetlights are installed at the County's expense based on citizens' requests and at the developer's expense in new developments. The costs of this program fund the installation of streetlights and are supported by the General Fund. In recent years, the Board of Supervisors has established a new approach for funding streetlight projects. A new program entitled "Prioritized Capital Projects" has been established for each Supervisor District. If surplus funding is identified throughout the fiscal year and dedicated for this program, each Board member receives an equal portion of the funding and works with the Department of Public Works and Environmental Services to address the top priority projects.

Many neighborhoods in Fairfax County which were built before subdivision control ordinances were enacted, lack such public facilities as sidewalks, curbs, gutters and storm sewers. As a result, some of these neighborhoods have roads that are too narrow to accommodate today's traffic. They lack sidewalks for safe access to schools and shopping, and they experience flooding in streets, yards and homes. These conditions contribute to the deterioration of neighborhoods and the decline of property values. In an effort to remedy this situation, the Board of Supervisors established the cooperative Neighborhood Improvement Program. This program is funded through General Obligation Bonds and homeowners' contributions. A minimal amount of bond funding still remains from the bond referendum in 1989 for neighborhood improvements. All of the final neighborhood improvements in the current program are complete or currently under construction.

CURRENT PROJECT DESCRIPTIONS

Stormwater Management Program. The approximate value of one penny of the County's Real Estate tax rate will be used to fund projects to address the County's stormwater requirements noted below. During FY 2007, two major program milestones will occur: completion of the watershed plans for all 30 watersheds in the County, and renewal of the Virginia Pollutant Discharge Elimination System (VPDES) Municipal Separate Storm Sewer System (MS4) discharge permit. Both of these activities map the strategic direction of the stormwater program during this CIP period and beyond.

1. **Watershed Planning** (Countywide): This project provides funding to complete Countywide watershed management planning efforts. No additional funding from the penny of real estate tax allocation will be required beyond FY 2007 for this activity. All watershed management plans will be complete by FY 2010.

2. **Watershed Projects Implementation** (Countywide): This is a continuing project. As watershed management plans are developed for each of the 30 watersheds in the County, projects are identified that will restore and protect the County's streams. In FY 2007, projects will be implemented in the Little Hunting Creek, Popes Head Creek, Cub Run, Cameron Run, Difficult Run, and Pimmit Run watersheds. Future projects will follow in Bull Neck Run, Bull Run, Horsepen Creek, Scotts Run, Sugarland Run, and Turkey Run. As the number of watershed plans is completed over time, implementation funding will be distributed amongst the various watersheds based on prioritization strategies developed in the planning process.

3. **Kingstowne Environmental Monitoring Program** (Lee): This is a continuing project to monitor for phosphorus and sediment related to the Kingstowne Development and U.S. Corps of Engineers permit requirements for the South Van Dorn Street extension. A new monitoring station has been installed on Dogue Creek as part of the monitoring and maintenance plan for the South Van Dorn extension project. This program is required to evaluate the effectiveness of stormwater management controls with an emphasis on phosphorus and sediment.

4. **Dam Safety** (Countywide): This is a continuing project to fund improvements necessary to meet State permit requirements, assess and monitor dams, and perform other associated dam repair activities. The Virginia Department of Conservation and Recreation regulates approximately 24 dams that are maintained by the Department of Public Works and Environmental Services. These dams are in varying stages of the State permitting process, from having received the approved six-year certifications, to initial scoping to determine if the dams meet the criteria for requiring State certification. In order to obtain the required permit, the County must perform enhanced inspections of all dams and address safety requirements. In addition, the County also maintains in excess of 1,100 non-classified dams that require annual assessment and associated repair activities.

5. **Virginia Pollutant Discharge Elimination System - Municipal Separate Storm Sewer System (MS4)** (Countywide): This is an on-going Countywide program to manage the activities associated with the MS4 discharge permit. The next permit renewal will occur in January 2007, with additional requirements anticipated during this CIP period. The MS4 discharge permit provides the overarching basis for the County's development of a comprehensive stormwater management program, consisting of watershed management plans, project implementation, monitoring, dam safety, and infrastructure maintenance. The permit also serves as a mechanism through which special actions may be required by the state to address water bodies on the state's impaired water list that do not meet water quality standards.

6. **Emergency Watershed Projects** (Countywide): This is a continuing Countywide project that supports the immediate correction of small-scale emergency drainage problems that arise throughout the year. This program allows the County to proactively address issues that may otherwise result in delays in addressing safety deficiencies.

7. **Storm Drainage Improvements and Innovative Projects** (Countywide): This is a continuing project to address significant potential storm drainage projects that are not initiated in advance through the watershed planning effort. These storm drainage projects typically arise from response to citizen requests for assistance, and provides for timely and effective response to address storm drainage deficiencies throughout the County. In addition, the project funds the retrofit of existing County owned buildings and facilities with innovative stormwater control projects in order to meet increasing water quality standards resulting from the County's MS4 permit requirements. The program allows the County to efficiently respond to Countywide storm drainage issues identified during the year that are not part of existing plans, as well as provide funding to support new environmental stormwater initiatives related to the treatment of stormwater runoff at County owned facilities.

8. **Stormwater Program Support** (Countywide): This is a continuing Countywide project to provide for additional field inspection, stormwater analysis, and construction quality control required due to the increase in projects resulting from the County's stormwater implementation program. The County's aggressive stormwater implementation program, and resulting increase in projects, requires assistance from contract employees assigned to work under the direction of County staff, and perform inspection, testing, research and analysis, utility coordination, and project close-out.

9. **Stormwater Management Facilities** (Countywide): This is a continuing project that funds a comprehensive engineering and inspection assessment of the public and private stormwater management infrastructure as required under the County's MS4 permit. This work includes field inspection activities, punch list development, private owner training, coordination, and outreach, enforcement, and construction quality control of rehabilitation activities.

10. **Infrastructure Reinvestment Program** (Countywide): This is a continuing project to support a comprehensive inspection, design, and contract administration program to rehabilitate, upgrade, and replace dilapidated County storm drainage infrastructure. The County storm drainage network consists of over 1,800 miles of pipe and in excess of 45,000 drainage structures. Much of this drainage system is nearing the end of its useful life. The initial program includes assessment and upgrade of approximately 50 miles of pipe, which represents approximately 3.5 percent of the total infrastructure and a 2820-year inspection cycle. In the future, it is anticipated that approximately 5 percent of the drainage network is to be assessed and inspected upgraded annually.

Other Neighborhood Improvements:

11. **Developer Defaults** (Countywide): The Developer Default project is a continuing program for the purpose of completing private development projects on which developers have defaulted. There has been an increased level of activity for this program in recent years, and current projections suggest this trend will continue. Land Development Services (LDS) anticipates 18 to 20 new projects will be identified for resolution in FY 2008. In the past, on average, 5 new projects were identified each year. This program is supported by developer bonds and the General Fund.

12. **Payments of Interest on Conservation Bonds** (Countywide): This project provides for payments to developers for interest earned on conservation bond deposits. The County requires developers to make deposits to ensure the conservation of existing natural resources. Upon satisfactory completion of the project, the developer is refunded the deposit with interest. Funding is based on prior year actual expenditures and current interest rates.

13. **Streetlights** (Countywide): This is an on-going project which provides for the installation of streetlights on a countywide basis. In recent years, the Board of Supervisors has established a new approach for funding streetlight, trails, and sidewalk projects. A new program entitled "Prioritized Capital Projects" has been established for each Supervisor District. If surplus funding is identified throughout the fiscal year and dedicated for this program, each Board member receives an equal portion of the funding and works with the Department of Public Works and Environmental Services to address the top priority projects.

14. **Minor Streetlight Upgrade** (Countywide): This program is for the upgrading of existing streetlights that do not meet current illumination standards for roadways, based on citizens' requests.

15. **Survey Control Network Monumentation** (Countywide): This is a continuing project to support the establishment, maintenance, and publication of survey control monuments. These monuments, used by private and public sector, are the terrestrial framework for geospatial control of surveying, mapping, and land development projects. The survey control monuments provide the spatial control for the County GIS system. This monumentation work is necessary to assist Surveyors and Engineers in developing site plans in accordance with the requirements of the Fairfax County Public Facilities Manual.

16. **Holmes Run Valley** (Mason): $50,000 for planning associated with a project to support street and drainage improvements for the following streets: Rose Lane, Valley Brook Drive, Beechtree Lane, Slade Run Drive, and Skyview Terrace. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

17. **Mount Vernon Hills** (Mt. Vernon): $50,000 for planning associated with a project to support street and drainage improvements for the following streets: Maryland Street, Vernon Avenue, Braddock Avenue, Sexton Street, Woodward Avenue, and Curtis Avenue. This project is supported by the 1989 Neighborhood Improvement Bond Referendum.

PROJECT COST SUMMARIES
STORMWATER MANAGEMENT AND OTHER NEIGHBORHOOD IMPROVEMENTS
($000's)

Project Title/ Project Number	Source of Funds	Budgeted or Expended Through FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	Total FY2008-FY2012	Total FY2013-FY2017	Total Project Estimate
STORMWATER MANAGEMENT / PRIORITY STORMWATER PROJECTS (Approximate value of $0.01 on the real estate tax).										
1 Watershed Planning	R	***C***						0		0
2 Watershed Projects Implementation	R	***11,825***								11,825
a. Little Hunting Creek Watershed Projects / LH8000	R	***C***	***1,000***	500	425	425	425	2,775	2,125	4,900
b. Popes Head Creek Watershed Projects / PH8000	R	***C***	***1,000***	500	425	425	425	2,775	2,125	4,900
c. Cub Run Watershed Projects / CU8000	R	***C***	***1,000***	500	425	425	425	2,775	2,125	4,900
d. Cameron Run Watershed Projects / CA8000	R	***C***	***1,000***	500	425	425	425	2,775	2,125	4,900
e. Difficult Run Watershed Projects / DF8000	R	***C***	***1,000***	500	425	425	425	2,775	2,125	4,900
f. Pimmit Run Watershed Projects / PM8000	R	***C***	***1,000***	500	425	425	425	2,775	2,125	4,900
g. Interim Watershed Program / FX0001	R	***C***	***1,865***	3,365	3,815	3,815	3,815	16,675	19,075	35,750
3 Kingstowne Environmental Monitoring Program / DC8000	R	***C***	***300***	300	300	300	300	1,500	1,500	3,000
4 Dam Safety and Repair Project / FX4000	R	***C***	***2,720***	2,720	2,720	2,720	2,720	13,600	13,600	27,200
5 Municipal Storm Sewer Permit (MS4) / FX7000	R	***C***	***1,740***	1,740	1,740	1740	1,740	8,700	8,700	17,400
6 Emergency Watershed Projects House Floodings and Other Emergencies / FX8000	R	***C***	***195***	195	195	195	195	975	975	1,950
7 Storm Drainage Improvements and Innovative Projects / FX1000	R	***C***	***1,800***	1,800	1,800	1,800	1,800	9,000	5,000	14,000
8 Stormwater Program Support / FX3000	R	***C***	***250***	250	250	250	250	1,250	1,250	2,500
9 Stormwater Management Facilities / FX5000	R	***C***	***1,000***	1,000	1,000	1,000	1,000	5,000	5,000	10,000
10 Infrastructure Reinvestment Program / FX6000	R	***C***	***6,830***	8,330	8,330	8,330	8,330	40,150	41,650	81,800
STORMWATER MANAGEMENT / PRIORITY STORMWATER PROJECTS Subtotal *		***11,825***	22,700	22,700	22,700	22,700	22,700	113,500	109,500	234,825

PROJECT COST SUMMARIES
STORMWATER MANAGEMENT AND OTHER NEIGHBORHOOD IMPROVEMENTS
($000's)

Project Title/ Project Number	Source of Funds	Budgeted or Expended Through FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	Total FY2008-FY2012	Total FY2013-FY2017	Total Project Estimate
OTHER NEIGHBORHOOD IMPROVEMENTS										
11 Developer Defaults / U00006	G, X	***C***	***750***	750	750	750	750	3,750	3,750	7,500
12 Payments of Interest on Conservation Bonds / 009998	G	***C***	***100***					100		100
13 Streetlights / Z00001	G	***C***						0		TBD
14 Minor Streetlight Upgrade / Z00016	G	***C***	***20***	20	20	20	20	100	100	200
15 Survey Control Network Monumentation / U00005	G	***C***	***125***	125	125	125	125	625	625	1,250
16 Holmes Run Valley / C00097	B	***10***	***40***					40		50
17 Mount Vernon Hills / C00098	B	***10***	***40***					40		50
OTHER NEIGHBORHOOD IMPROVEMENTS Subtotal		***20***	1,075	895	895	895	895	4,655	4,475	9,150
TOTAL		***$11,845***	$23,775	$23,595	$23,595	$23,595	$23,595	$118,155	$113,975	$243,975

Key: Stage of Development
- Feasibility Study or Design
- Land Acquisition
- Construction

Notes:
Numbers in ***bold italics*** represent funded amounts.

A "***C***" in the 'Budgeted or Expended' column denotes a continuing project.

Key: Source of Funds

B	Bonds
G	General Fund
F	Federal
X	Other
U	Undetermined
R	Real Estate Tax Revenue

* Amount estimated for FY 2009 - FY 2012 will vary, depending on the value of one penny of the real estate tax rate each year.

Stormwater Management Project Locations

2a Little Hunting Creek Watershed
2b Popes Head Creek Watershed
2c Cub Run Watershed
2d Cameron Run Watershed
2e Difficult Run Watershed
2f Pimmit Run Watershed
3 Kingstowne Environmental Monitoring
16 Holmes Run Valley
17 Mount Vernon Hills

Note: Map numbers correspond to project descriptions in the text and cost summary tables. Only CIP projects with selected, fixed sites are shown on the map.